CLAIMS

1. A method of decontaminating heavy metal contaminated soil or sludge which includes

a) treating soil or sludge with an acid liqour at a pH below 2 and at a solids content from 5 to 30% in a first treatment stage

b) separating the liquid and solid phases from the first treatment stage

c) mixing the solids from the first treatment stage with a fresh acid liquor at a pH below 2 and a solids content from 5 to 30% in a second treatment stage

d) separating the liquid and solid phases from the second treatment stage

e) treating the liquor separated in step b) from the first treatment stage to precipitate heavy metals

f) separating the precipitated heavy metals from the liquor of step e) and recycling the liquor for use in the process

g) treating the solids from step d) to adjust the pH to a level acceptable for a soil conditioner or fertilizer

h) using the liquor from step d) as the acidic liquor in the first treatment stage for fresh batches of soil or sludge.

2. A method as claimed in claim 1 in which the acid is sulfuric acid.

3. A method as claimed in claim 1 in which the heavy metals are precipitated by adding a base to adjust the pH of the liquor to precipitate the metals as salts

4. A method as claimed in claim 3 in which the base is potassium hydroxide.

5. A method as claimed in claim 1 in which the solids from step d) are blended with crushed limestone.

6. A method as claimed in claim 1 in which the first and second treatment stages are carried out in closed vessels containing a source of ozone in the head space of the closed vessels.

7. A method of decontaminating contaminated soil or sludge which includes sulfur containing materials which method includes
    a) treating soil or sludge with an acid liquor at a pH below 2 and at a solids content from 5 to 30% in a closed vessel containing a source of ozone in the head space of the closed vessel.
    b) separating the liquid and solid phases from the treatment stage
    c) treating the liquor separated in step b) from the treatment stage to precipitate heavy metals
    d) separating the precipitated metals from the liquor of step c) and recycling the liquor for reuse in the process
    e) treating the solids from step b) to adjust the pH to a level acceptable for a soil conditioner or fertilizer

8. A method as claimed in claim 7 wherein the ozone is externally generated and introduced into the head space.